

National Health and Nutrition Examination Survey 2003-2004

Documentation, Codebook, and Frequencies

MEC Laboratory Component:
Vitamin C

Survey Years:
2003 to 2004

SAS Export File:
L06VIT_C.XPT



April 2006

NHANES 2003–2004 Data Documentation

Laboratory Assessment: Lab 6 –Vitamin C

Years of Coverage: 2003–2004

First Published: April 2006

Last Revised: N/A

Component Description

The objectives of this component are: 1) to provide data for monitoring secular trends in measures of nutritional status in the U.S. population; 2) to evaluate the effect of people's habits and behaviors such as physical activity and the use of alcohol, tobacco, and dietary supplements on people's nutritional status; and 3) to evaluate the effect of changes in nutrition and public health policies including welfare reform legislation, food fortification policy, and child nutrition programs on the nutritional status of the U.S. population. These data will be used to estimate deficiencies and toxicities of specific nutrients in the population and subgroups, to provide population reference data, and to estimate the contribution of diet, supplements, and other factors to serum levels of nutrients. Data will be used for research to further define nutrient requirements as well as optimal levels for disease prevention and health promotion.

Eligible Sample

Participants aged 6 years and older who do not meet any of the exclusion criteria are eligible.

Description of Laboratory Methodology

Vitamin C (ascorbic acid) in serum is measured by isocratic HPLC with electrochemical detection at 650 mV. One part serum is mixed with four parts of 6% MPA to acidify the serum and stabilize the ascorbate. The specimen is frozen at -70°C until analysis. After the specimen is thawed at room temperature and centrifuged at 2500 rpm, the supernatant is decanted. This supernatant is mixed with a solution containing trisodium phosphate and dithiothreitol (to reduce dehydroascorbate to ascorbate) and then re-acidified with 40% MPA to stabilize the ascorbate. The sample is filtered to remove insoluble material. An aliquot is injected onto a C-18 reversed-phase column and eluted with a mobile phase containing 0.15 mol/L monochloroacetic acid, 2 mmol/L disodium ethylenediamine tetraacetate, and 0.13 mmol/L octylsulfonic acid, adjusted to $\text{pH } 3.00 \pm 0.05$ with 10 N sodium hydroxide. Quantitation is by peak height and is based on a standard curve generated by using three different concentrations of an external standard (0.005, 0.030, and 0.100 mg/dL).

A detailed description of the laboratory method used can be found on the NHANES website.

Laboratory Quality Control and Monitoring

The NHANES quality assurance and quality control (QA/QC) protocols meet the 1988 Clinical Laboratory Improvement Act mandates. Detailed QA/QC instructions are discussed in the NHANES Laboratory/Medical Technologists Procedures Manual (LPM). Read the LABDOC file for detailed QA/QC protocols.

A detailed description of the quality assurance and quality control procedures can be found on the NHANES website.

Data Processing and Editing

Serum specimens are processed, stored, and shipped to the Division of Laboratory Sciences, National Center for Environmental Health, and Centers for Disease Control and Prevention for analysis.

Detailed specimen collection and processing instructions are discussed in the NHANES LPM. Vials are stored under appropriate frozen (-20°C) conditions until they are shipped to National Center for Environmental Health for testing.

This file contains no top coding; however, 11 results were set to missing because of possible contamination.

One derived variable was created in this data file. The formula for its derivatization is as follows:

The vitamin C in mg/dL was converted to $\mu\text{mol/L}$ by multiplying by 56.78.

Testing for vitamin C began in 2003. Detailed instructions on specimen collection and processing can be found on the NHANES website.

Analytic Notes

The analysis of NHANES 2003–2004 laboratory data must be conducted with the key survey design and basic demographic variables. The NHANES 2003–2004 Household Questionnaire Data Files contain demographic data, health indicators, and other related information collected during household interviews. The Household Questionnaire Data Files also contain all survey design variables and sample weights required to analyze these data. The Phlebotomy Examination file includes auxiliary information on duration of fasting, the time of day of the venipuncture, and the conditions precluding venipuncture. The Household Questionnaire and Phlebotomy Exam files may be linked to the laboratory data file using the unique survey participant identifier SEQN.

References N/A

Locator Fields

Title: Vitamin C

Contact Number: 1-866-441-NCHS

Years of Content: 2003–2004

First Published: April 2006

Revised: N/A

Access Constraints: None

Use Constraints: None

Geographic Coverage: National

Subject: Vitamin C

Record Source: NHANES 2003–2004

Survey Methodology: NHANES 2003–2004 is a stratified multistage probability sample of the civilian non-institutionalized population of the U.S.

Medium: NHANES Web site; SAS transport files

National Health and Nutrition Examination Survey Codebook for Data Production (2003-2004)

Vitamin C (L06VIC_C) Person Level Data

April 2006



SEQN	Target
	B(6 Yrs. to 150 Yrs.)
Hard Edits	SAS Label
	Respondent sequence number
English Text: Respondent sequence number.	
English Instructions:	

LBXVIC	Target			
	B(6 Yrs. to 150 Yrs.)			
Hard Edits	SAS Label			
0 to 999	Vitamin C (mg/dL)			
English Text: Vitamin C				
English Instructions:				
Code or Value	Description	Count	Cumulative	Skip to Item
0.02 to 4.83	Range of Values	7267	7267	
0.01	Below Limit of Detection	10	7277	
.	Missing	705	7982	

LBDVICS	Target			
	B(6 Yrs. to 150 Yrs.)			
Hard Edits	SAS Label			
	Vitamin C (umol/L)			
English Text: Vitamin C (umol/L)				
English Instructions:				
Code or Value	Description	Count	Cumulative	Skip to Item
1 to 274	Range of Values	7277	7277	
.	Missing	705	7982	